

## **ABSTRACT**

A coil apparatus is described that incorporates two or more conductors, wound in parallel, following the same path, in intimate physical contact throughout the path but electrically isolated. The current applied to each of the coils can be selected independently. The field generated by the coil, or force on the coil in a magnetic field, is proportional to the algebraic sum of the currents. The power applied to the coil is proportional to the sum of square of the currents. By independently selecting the appropriate current's to apply to each of the conductors, a desired field, or force, can be generated by the coil for any desired power applied to the coil. By judiciously selecting appropriate currents to apply to each of the conductors, a range of fields, or forces, may be selected for which a constant power may be applied to the coil. A constant power enables the coil to operate at a constant temperature.